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The PhageCoop-Principle

The predominant portion of the Earth's biomass consists of the microbiom, i.e. bacteria. virus and fungi. The human being is actually a super-organism, because on each individual cell of our body there are 10 bacteria. Bacteria are vital for our body and only 3 of 1000 kinds of bacteria are pathogenic. Take our bowels, they contain 10.000 types of bacteria, a total weight of 1,5kg. The most wide-spread form of life on our planet however are bacteriophages (BP), which exceed the number of all bacteria (estimated 10^{30} to 10^{32}) by a tenfold potency. They are very much smaller than bacteria (usually 200nm). In our bowels (and not only there) there are hundreds of species of BP. They are natural antagonists of bacteria and they exist everywhere on the Earth (in water, soil, ice, black smokers). Within 2 days they destroy 30 -50% of all bacteria world-wide. In this way they form an essential part of the CO₂-control system of the Earth of the oceans because the dead bacteria sink to the bottom of the sea. Since the discovery of

the BP a 100 years ago manifold attempts were taken up to use BP also therapeutically. Contrary to antibiotica the BP effects only specifically one single strain of bacteria. For their propagation they always need one host bacterium. If this is not or no longer available the BP die off. So they cannot be excessively overdosed. Their commercial utilization usually failed as the BP could not be protected by licensing and because of their short lifetime limit (also because of the constant variation of the bacteria). With the development of antibiotica in the 1930s and 1940s of the last century one thought to have found a more effective alternative. However already in his Nobel-prize inauguration speech in 1945 Alexander Fleming warned against an excessive use of antibiotica and the possible formation of resistancs. Since that time we discover resistances more and more frequently. With the discovery of antibiotica the human being has changed the microbiom of the earth more drastically than in the past 2.5 billion years. That is true not only for antibiotica but also for all chemicals that get into the circulation of our environrment. It has been proved that bactcria use non-lethal doses of Chemicals not only to develop resistant strains, but they also anticipate the effect of similar substances. They are qualified for this because they too form a huge super-organism with unbelievable redundancy co-operating informationally (exchange of genes, even between different strains). Especially in the more recent years it became evident that the speed of resistance formation surpasses by far the speed of the development of new reaction-mechanisms of antibiotica. Today humanity is more endangered by multi-resistence stems of bacteria

than by Ebola or SARS.

One reckons that more than 10 million casualties annually because of antibiotica resistance.

90% of all infectious illnesses and diseases are bacteria infected. What is consequently more plausible than letting their natural antagonists fight against these bacteria. For this reason we must make these BP available where they are needed. Almost all stems of BP effective against illnesses and diseases have been found in sewage. In nature there is no "waste", all which can be considered source of nourishment will be used as such by the BP. So if resistant bacteria stems appear in the sewage a BP stem will adapt itself to this new bacteria stem in no time. One can accelerate this procedure by propagating the new bacteria stem that has not yet an antagonist and add this to the sewage as a new source of nourishment for the BP.

In conclusion it can be said that only the closing of the natural circuit among bacteria and all other living organisms and all BP can solve fundamentally this problem. In this way our sewage systems (micro- as well as macro-scopic) can become our future drugstores and pharmacies.

In order to face the antibiotica-crisis all mankind as well must join to form a super-organism. This is to be done by combining the bacteria of all human beings by their excrements or special swabs or smears. They have to be added to the sewage Systems with their BP (which originally came from natural sources) and then an equilibrium will develop as in (untempered) nature. This equilibrium will be established all the more quickly where there are

fewer Chemicals which can disturb the process and if the environmental conditions of the sewage systems are more closely similar to those where nature has developed the greatest diversity of BP. The separation of BP and bacteria can be accomplished by filtration or by a centrifuge process (there are indications that the added bacteria could damage a portion of the BP). The consequential action consists of adding the established BP diversity again to the drinking water which should be absorbed orally as quickly as possible (because of their separation from the host) by the living organisms. In humans (and most mammals) the BP are destroyed by the gastric acid. A short-term neutralization followed by a simple intake of water can initiate the medical effect in the body (starting in the stomach- bowel-tract) (apart from the permanent disinfection effect of the environment). A continuous external application of this new BP containing water in mass-livestock breeding can reduce considerably the propagation speed of the infiltration of pathogen organisms. The mere contact with an animal that has been treated with phages is sufficient to colonize the non-treated. In hospitals which have provoked the development of resistant bacteria by pouring waste-water with antibiotic in sublethal doses (for this reason the waste-water of hospitals are strictly speaking chemical wastes) would close the circuit by destroying with BP of their own sewage. The number of nosocomical infections in hospitals could be radically reduced. So the decisive factor is the socialization of all pathogen germs in one sewage basin. There the right sort of BP could then be found which by increasing their concentration could eliminate acute cases of illnesses and diseases. The continuous exchange of certain quantities of waste-water of hospitals among each other increase the diversity of the microbiom in this way and consequently extend the formation of new BP of each sewage treatment. The same procedure is recommended for the municipal sewage installations. The continuous enrichment of the diversity of the BP is to be increased by the

samples of natural sewage sources.

This circuit is to be closed with tablets of compressed BP concentration from these collective sewage basins, and the intravenous treatment is also an option. The ultimate aim must be to reduce definitely the use of antibiotics, because we pay for this with an even more accelerated formation of resistances.

It is high time for a change of paradigms. The extent and the importance for the whole human race have induced the authors to publish this method as 'Creative Commons'. It is too important for the future health of mankind to leave this method in the hands of business. The method is so simple that everybody can start with. But as soon as commercial firms benefit financially from these naturally available resources these commons (BP) will be withdrawn from general use to profit financially a minority. This method is to benefit all humanity independent of financial resources.

A first step could be the introduction of the PhageCoop-Principle in the mass-livestock breeding.

"Your nutrition ought to be your medicine. your medicine should be your nutrition"
Hippocrates

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